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CLAIMS:

1. Flowmeter sensing circuitry, comprising:

first and second inputs for connection to potential sensing electrodes positioned to measure a potential difference across the fluid which potential is representative of flow;

differential amplifier means coupled to the first and second inputs for producing an output signal indicative of said potential difference across the fluid as a measure of flow; characterised by

at least one voltage sensing means for sensing a voltage of at least one of the first and second inputs relative to a ground reference; and

fault detecting means for detecting a potential fault if the voltage is outside a predetermined range.

2. Flowmeter sensing circuitry according to Claim 1, wherein the fault detecting means comprises means for storing a log of samples of the voltage over a period of time.

3. Flowmeter sensing circuitry according to Claim 1, wherein the voltage sensing means and the fault detecting means are arranged to store samples at sampling intervals of one minute or less.

4. Flowmeter sensing circuitry according to Claim 1, wherein the ground reference is connected to a ground reference of the differential amplifier.

5. Flowmeter sensing circuitry according to Claim 1, wherein the fault detection means includes maximum and/or minimum detection means for obtaining a measure of maximum and/or minimum voltage over a sampling interval.

6. Flowmeter sensing circuitry according to Claim 1, further including means for storing the or each measure of voltage together with a measure of meter

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output.

7. Flowmeter sensing circuitry according to Claim 1, further including means for signalling an alarm in the event of detection of a fault or potential fault condition.

5 8. Flowmeter sensing circuitry according to Claim 1, further including means for modifying the output of the meter in the event of detection of a fault or potential fault condition.

9. Flowmeter sensing circuitry according to Claim 8, wherein the modifying means comprises means for switching to a default value, preferably zero.

10 10. Flowmeter sensing circuitry according to Claim 8, wherein the modifying means comprises means for maintaining the output at a value based on the output value preceding detection of the fault.

11. Flowmeter sensing circuitry according to Claim 1 including means for storing a measure of statistical information derived from samples.

15 12. Flowmeter sensing circuitry according to Claim 1 including means for obtaining measurements of electrode voltage related to the phase of the local mains voltage.

20 13. Flowmeter sensing circuitry according to Claim 1, wherein the differential amplifier has a high input impedance, preferably of the order of at least 10^{12} ohm.

14. Flowmeter sensing circuitry according to Claim 1, wherein the voltage sensing means has an input impedance of at least the same order of magnitude as the differential amplifier.

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15. Flowmeter sensing circuitry according to Claim 1, wherein the predetermined range is selected based on an operational characteristic of the differential amplifier means.

5 16. Flowmeter sensing circuitry according to Claim 1, wherein the predetermined range is selected based on a voltage with respect to ground at which clipping or distortion is liable to occur in the differential amplifier means.

10 17. An analysis tool for detecting a potential fault in a flowmeter installation comprising means for receiving an input of the voltage of at least one potential sensing electrode of the flowmeter with respect to ground over a period of time and means for identifying from said input excursions of said voltage outside a predetermined range.

18. An analysis tool according to Claim 17, comprising means for receiving measurements of voltage from storage means for storing the potential as a series of samples in digital form.

15 19. An analysis tool according to Claim 17, wherein the predetermined range is selected based on an operational characteristic of a differential amplifier means of the flowmeter installation.

20 20. An analysis tool according to Claim 19, wherein the predetermined range is selected based on a value of the input voltage with respect to ground at which clipping or distortion is liable to occur in the differential amplifier means.

25 21. A method of detecting a potential fault in flowmeter sensing circuitry comprising first and second inputs for connection to potential sensing electrodes positioned to measure a potential difference across the fluid which potential is representative of flow and differential amplifier means coupled to the first and second inputs for producing an output signal indicative of said potential

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difference across the fluid as a measure of flow, the method comprising:

sensing a voltage of at least one of the first and second inputs relative to a ground reference; and

detecting a potential fault by detecting whether the voltage is outside a predetermined range.

22. A method according to Claim 21, further comprising storing a log of samples of the voltage over a period of time.

23. A method according to Claim 21, further comprising sampling the voltage at least once per sampling interval of one minute.

24. A method according to Claim 21, including obtaining a measure of maximum and/or minimum voltage over a sampling interval.

25. A method according to Claim 21, further including storing the or each measure of voltage together with a measure of meter output.

26. A method according to Claim 21, further including signalling an alarm in the event of detection of a fault or potential fault condition.

27. A method according to Claim 21, further including modifying the output of the meter in the event of detection of a fault or potential fault condition.

28. A method according to Claim 27, wherein modifying comprises switching to a default value, preferably zero.

29. A method according to Claim 27, wherein modifying comprises maintaining the output at a value based on the output value preceding detection of the fault.

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30. A method according to Claim 21, further including adjusting the phase at which measures of voltage are obtained relative to local mains voltage.

5 31. A method according to Claim 21, wherein the predetermined range is selected based on an operational characteristic of the differential amplifier means.

32. A method according to Claim 21, wherein the predetermined range is selected based on a voltage with respect to ground at which clipping or distortion is liable to occur in the differential amplifier means.

10 33. Use of a measure of voltage with respect to a ground reference voltage of an input of a differential amplifier of flowmeter sensing circuitry to detect a potential fault condition.

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